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Sustainability in Quality Control for Delivery Competency-Based Training (CBT) in Oil & Gas Skills Institution

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Abstract

The evolution and efficacy of technical and vocational education and training (TVET) in Malaysia, focusing on the shift towards competency-based training (CBT), As economies transition to more knowledge-based activities, the gap between educational outputs and labor market needs has widened, necessitating a transformation in vocational training. TVET, traditionally designed to prepare students directly for the workforce by imparting practical skills and theoretical knowledge, is increasingly seen as critical to addressing the skill mismatch in emerging economies. This paper reviews the restructuring of TVET into a more dynamic and responsive system through the implementation of CBT. This approach emphasizes real-world applicability and continuous skill assessment aligned with industry standards. The restructuring process within Malaysian TVET, including curriculum updates to incorporate entrepreneurship and soft skills like problem-solving and critical thinking, aims to produce graduates who are job-ready and adaptable to rapidly changing technologies and job markets. The CBT model fosters a learner-centered environment where education is closely linked to industry needs, promoting ongoing engagement with business players and industry feedback to ensure relevance. However, the transition also presents significant challenges, including resource allocation, instructor training, and the scaling of CBT methodologies across various training centers. While the shift towards a competency-based model in Malaysian TVET has shown promising results in bridging the educational and employment gap, continued focus on overcoming logistical and financial obstacles is essential for maximizing the potential of TVET systems to contribute to national economic growth and reduce unemployment among the youth.

Keywords: Competency-Based Training, Tvet, Industry-Led Skills, Workplace Experience, National Tvet Qualification Framework.

Introduction

Technical and Vocational Education and Training (TVET) equips a population with crucial skills and knowledge, facilitating their transition into the workforce (Manabete & Umar, 2018). TVET integrates a spectrum of educational modes; formal, informal, and non-formal to prepare young people comprehensively for employment challenges (Kanwar et al., 2019). TVET enriches general education by merging sciences, technology, attitudes, practical skills, understanding, as well as information regarding employment in various social and economic sectors, as stated by the United Nations Organization for Education, Science, and Culture (UNESCO). TVET institutions stand at the forefront of addressing immediate and strategic workforce needs, supplying skill essential for tackling sustainability-related problems in industries (Paryono, 2017) such as oil and gas.

As global economic landscapes evolve and technological advancements redefine skill requirements, TVET's role has become more critical than ever (Park, 2009). The need for this study emerges from the vital necessity to enhance TVET's responsiveness to the shifting demands of the job market, particularly in high-stakes industries where competency and quality control are paramount. The dynamic nature of TVET is evident as it continuously adapts to industry, schools, and society changes. In developing nations, TVET has been a key area for investment, and a few initiatives have been launched to combat unemployment issues and advance economic growth (Gyimah, 2020; Mazlan et al., 2015). Nevertheless, it is important to note that TVET institutions encounter difficulties in addressing the constantly changing skill demands of the market, which necessitates teaching desirable skills to aspire graduates since many graduates hardly have the competencies necessary to succeed in the job (Naanda, 2010).

This research is crucial as it explores how Competency-Based Training (CBT) within TVET can be optimized to better align with industry standards, particularly in the oil and gas sector. By focusing on CBT's implementation in Malaysia as a country that has seen significant educational transformations aimed at economic improvement. This study assesses the impact of these changes on the quality and sustainability of workforce training. Moreover, the curriculum for TVET in Malaysia now includes entrepreneurship (Kenayathulla, 2021). Every TVET program have as its main goal the production of a sufficient number of people with the necessary skills to meet the demands of the labor market (Mazlan et al., 2015). TVET Programs must balance the abilities, knowledge, and attitudes of their students with the demands of the labor market (Chukwu et al., 2020). By creating and utilizing new job opportunities, it aims to build competent and independent individuals in Malaysia who will contribute to the economic and social development of the nation (Hanafi et al., 2022).

The growth of the educational system based on high-quality vocational and technical skills is crucial to aid in the advancement of the economy in every nation, particularly in emerging countries, claims research by (Seng, 2008). Particularly now, when knowledge and competitiveness are the constant forces behind the growth of the world economy. Among the fundamental components of growth is education, and TVET plays a crucial role in this equation since it enables people and society to reach their full capacity while also adjusting to the constant transformation that characterizes today's dynamic world. Following this understanding, the orientation and philosophy centered on the vision of a developed nation via the presence of vision 2020 aim to change the educational system by making it highly

responsive to global and local needs as well as national aspirations and goals. Consequently, via an education system built on this TVET system, the policy formulation that will focus on the development of human resources, the reduction of poverty levels, the existence of job opportunities, as well as economic growth will be expedited.

Numerous reforms have been implemented in the sector, which includes the creation of the TVET Council, whereby it has been developed to be responsible for carrying out and monitoring all activities, technical and vocational activities to recognize the TVET system as a part of the keys to socioeconomic development in this nation. Coordination and supervision of all components of vocational and technical training and education across the nation is the fundamental goal of its foundation. Its establishment has brought about a paradigm shift in the TVET industry because of the body's dedicated and sincere efforts to reform the TVET-based education system using the CBT method at skill training centers in Malaysia. The two paradigms of the nation's TVET education system are compared in Table 1 below. The new paradigm will show how the TVET centered training system at the training center is implemented after receiving new information and inspiration. The old paradigm system indicates how for numerous years, skill training institutions or centers have conducted their training.

Table 1
Old and new paradigms of TVET

Old Paradigm of TVET	New Paradigm of TVET
Passive learners	Active Learners
Exam driven	Learners are evaluated continuously
Rote learning	Critical thinking, reflection, action, as well as reasoning
Syllabus depends on the content and disseminates into subjects	Integration of knowledge, skill as well as value/attitude, in which learning is applicable and relevant to real work and life situations.
Worksheet/textbook educator as well as bound centered	Training package/learning material, learner-centered, trainer/educator is the facilitator
Trainers/educators employ a "deductive" approach to teaching	Facilitators employ an "inductive" approach in facilitating
Views syllabus as non-negotiable and rigid	Learning programs are deemed as guidance that allows facilitators to be innovative and creative in designing program
Educators are responsible for learning, and motivation depends on the educator's personality	Learners are responsible for their learning, and learners are motivated by continuous feedback and affirmation of their effort and worth
Focus on what the educator aims to accomplish	Focus on outcomes (what the learner becomes and understands)
Content organized as per rigid timeframes	Flexible timeframes enable the learner to work at their own pace
The curriculum development process is not accessible to public comment	Input and comments from the broader stakeholders/community are welcomed

Source: Ministry of Education of Ghana (2011)

Competency-Based Training (CBT)

According to the research done by Anane (2013), CBT is a market-driven and demand-driven (outcomes-based) educational and training program built on clearly defined criteria created by the industry (occupational standards). The design and development of the program (curriculum), assessments, and learning materials are based on these industry standards. Instead of only teaching theoretical knowledge, CBT programs emphasize the skills that participants will need to be able to perform in the profession. Thus, it is a training program that guarantees students acquire the knowledge, abilities, and attitudes or values required to succeed in the workplace.

Program Characteristics

According to the research done by Delker (1990), Foyster (1990), and Norton (1987), programs based on competency have certain features. The two primary characteristics are that (i) the job-related competencies will be properly chosen, and (ii) theory will assist and relate to skill training. The teaching materials presented in training in detail are crucial to achieving the competence level that is desired. At the same time, it is also essential to prepare to assist the candidate in acquiring skills and knowledge. Subsequently, iv) The teaching approach, as well as methods delivered by the teaching staff, will involve the learning and mastery of prospective students. Therefore, the premise or training center needs to provide a sufficient period of teaching time. Using suitable training methods to be employed, thus, all potential students can master the skills or the knowledge needed as per the level of need, v) Prospective students' skills and knowledge will constantly be assessed when they engage in this program. Those who meet the requirements will be allowed to forego education and one education or already attained competence. vi) The learning technique employed must be self-paced, and vii) A flexible training strategy, encompassing those involving big groups, small group activities, as well as individual studies, is among the main components of teaching, viii) A variety of supporting materials in the learning process is essential, including printed materials, audiovisuals, and simulations (models) that can be used to help prospective students in mastering knowledge and skills. ix) The end of the learning and training process will be done after the prospective student has successfully achieved a satisfactory level of competence centered on achieving all the work competency conditions decided.

Training Program Structure

According to a study by Norton (1987), the five key components of the CBT system are as follows: i) The degree of competence to be acquired must first be carefully identified, confirmed, and communicated; ii) The standards under which the performance will be examined as well as the evaluation criteria that will be used are made explicit and disclosed in advance, and iii) Teaching programs that will provide personalized progress and assessment for each predetermined level of competency. iv) Competency level evaluation will consider participants' attitudes and knowledge in addition to the actual performance of work the field's competence evaluated as the primary source of proof. v) The development of candidates who comply with this teaching program is in accordance with the level of their individual capacity by demonstrating the level of competency accomplishment established by the standard.

Qualification Objectives

The following is the aim of qualifying based on competency: i) Setting a clear and measurable standard, ii) Developing competent individuals with transferable skills, iii) Connecting the

training and education concept with the skills that employees have gained and that employers have set, iv) Offering quality-assured teaching as well as a training system, giving confidence to all parties, for example, employers, educational institutions, and students, v) Developing the potential of each individual to the fullest vi) Promoting the lifelong learning concept. Note that there is a CBT model that is different from other foreign countries such as Indonesia, Singapore, and Thailand. The vocabulary used, the approach used to design the program, and the assessment technique is where the primary distinctions lie. The program's features, structure, and objectives, nevertheless, are identical for all models. All CBT models have been streamlined by the body in charge of overseeing vocational and technical programs in Malaysia to guarantee uniformity. This will make it easier for graduates to find employment, reducing poverty in society and creating economic progress in the country, reducing poverty and creating economic wealth, and promoting youth employment to the youth.

Program Delivery

As mentioned before, CBT is a program whose curriculum was developed depending on the requirements in the workplace. This will guarantee that the skills mismatch issue, which the sector has highlighted as one of the primary sources of unemployment, is dealt with. Therefore, vocational and technical-based program provider institutions discuss with business players and industry in related fields to produce a job standard that needs to meet the standards and requirements as well as produce a quality program. For all sorts of courses in their respective disciplines, a standard manual or specification known as the "Learning Unit Specification" will be established. As seen in the example in Table 2, the specification for this learning unit will set the degree, quality, as well as breadth of performance that prospective students must attain. The standards mentioned in the learning unit specification must also correlate to the national accomplishment criteria that ought to be suitable for the intended audience.

Table 2
Learning unit specification

Section	Manufacture and Refined Petroleum Products
Group	Oil & Gas and Petrochemical
Area	Rotating Equipment (Downstream & Upstream)
Noss title	Mechanical Instructor / Trainer
Competency unit title	Health, Safety & Environment (HSE)
Program level	Level 3
Date start	
Date completion	
Learning outcomes	The outcome of this competency unit is the capacity to supervise safe work procedures in the workplace in accordance with statutory standards. Learners must be able to, to achieve this competency unit effectively: 1. Prepare Job Method Statement (JMS) 2. Provide Input for Job Safety Analysis (JSA) 3. Prepare Permit to Work (PTW) 4. Conduct toolbox meeting

	5. Participate in HSE incident investigation
Delivery	Wherever feasible, the learning process should be practical, with teaching personnel supporting this by offering instances pertinent to the theory's application in practice. It is important to try to understand how principles, tools, and procedures are related to one another. Practical activity must be supervised and explored to offer students the chance to demonstrate that the learning objectives have been met. Alternative assessment methods must be evaluated to see whether learning outcomes may be reached when access to equipment is not properly or sufficiently accessible. Utilizing simulation tools, labs, or on-site work trips may be part of this.
Assessment	Classroom theories, assignments, videos, slide presentations, on-the-job training, site visits, practical workshops, simulations, internet-connected computer terminals, laboratory work, technical libraries, as well as face-to-face interactions can all serve as evidence of learning results. This comprises an "interview" session when experience and knowledge are shared and can be employed as proof of academic success in the classroom. Students will compile evidence in the form of a portfolio of their projects or the outcomes of a mix of homework assignments and exams monitored by the teacher. In all circumstances, the provided evidence must be relevant and sufficient in supporting the intended judgment.

Characteristics of Learning Unit Specification

The certification system's standards are established by the Learning Unit specification, which includes four basic components:

i) Learning Outcomes: Skills and knowledge that prospective students should possess by the conclusion of the unit.
ii) Performance Standards: Information and behaviors that prospective students should possess to attain certain learning outcomes.
iii) Range Statement: Learning requirements that students must meet to put it into practice.
iv) Evidence Requirements: This is the standard by which work is judged. CBT evaluation involves acquiring evidence of the student's performance to determine whether or to what degree a student has satisfied performance standards.

It will use a variety of methodologies in the review process, including:

i) Observation: monitoring students while they engage in work-related tasks.

ii) Product: seeing a finished item that the student created or worked on.
iii) Asking: posing questions to students about the module, to which they can respond in writing or orally.

Example of Learning Unit Specification

The structure for the Learning Unit Specifications for the course is as follows. This example is a technical skill area from the Safety Module of the Mechanical Engineering curriculum offered by the Training Skill Institution in Terengganu, Malaysia for oil and gas competency skills. Students will learn the abilities that must be attained after completing their courses, thanks to the material in the Learning Unit Specifications. Then, for every Learning Outcome (LO) stated in the Learning Unit Specification, the items anticipated to be learned and performed by each student to attain their individual LO are defined. For example, the following information is for the first LO listed in Table 3 of the Learning Unit Specification given above.

Table 3
Details of learning outcome health safety and environment (HSE)

CU Title & CU Code	CU Descriptor	Work Activities	Assessment & Performance Criteria
Health, Safety & Environment (HSE) Execution	Implementing work safety procedures in accordance with HSE standards is referred to as Health, Safety & Environment (HSE) implementation. It is crucial for staff members working in static equipment maintenance operations to always comprehend and follow HSE standards. A competent individual in this CU must be capable of creating Job	Prepare Job Method Statement (JMS)	1.1 Sequence of tasks identified by relying on the work manual and the company's SOP. 1.2 Job risk mitigation is examined based on the company's HSE Policy. 1.3 Work method is selected relying on the availability of resources. 1.4 Document format is recorded as per the company's SOP.
		Provide Input for Job Safety Analysis (JSA)	2.1 Job risks identified as per JSA. 2.2 Risk management is checked by relying on JSA and Permit to Work (PTW). 2.3 Selection of PPE is determined by relying on PTW and JSA. 2.4 Document recorded relying on the company's SOP.
		Prepare Permit to Work (PTW)	3.1 Job tasks are identified relying on resource availability and work schedule. 3.2 Work method described relies on the approved Job Method Statement (JMS).

	Method Statements (JMS), contributing to Job Safety Analysis (JSA), creating Permits to Work (PTW), conducting toolbox meetings, and taking part in HSE incident inspections. The result of this competency is safe working conditions at the workplace conducted as per Company and Health Safety and Environment's requirements. The competency owner must exhibit some level of leadership and communication ability to complete the CU.		3.3 PPE requirements are specified relying on approved PTW and JSA. 3.4 Inter-discipline support coordinated from the daily interface meeting based on operational requirements. 3.5 Document format reported depending on the company's SOP.
		Conduct toolbox meeting	4.1 Toolbox meetings are arranged to rely on the company's policy. 4.2 Job risks are presented relying on PTW and JSA. 4.3 Safety-related issues were discussed during toolbox meetings for work improvement. 4.4 Attendance at toolbox meetings compiled relying on the company's SOP. 4.5 Safety campaign topics are selected, relying on Safety Committee recommendations.
		Participate in HSE incident investigation	5.1 The chronological event was determined based on team members' interviews. 5.2 STOP work procedure is identified relying on the company's SOP. 5.3 Document format recorded based on the company's SOP.

Student-centered learning materials will then be developed for use by prospective students in unit specifications. The training materials will be presented in full. This will facilitate the student's impression of the degree of proficiency that must be attained and a strategy to assist the training in skills and knowledge development. Providing potential students with the freedom to learn and get instruction outside or inside of the classroom will help them reach their full potential. To promote active participation in learning via interaction with groups, peers, and the entire class, the content of these learning materials will include assessment instruments/peer assessment as well as self-evaluation tools for students.

Facilitation Methods Used for CBT Program

A distinct method of teaching, assessment, and certification will often be required for skills training that is centered on work efficiency. This is the case since Competency-Based Training (CBT) differs conceptually from earlier conventional approaches. It is unit-based or modular and is capable of being employed for both informal and formal training and education. It is built on competency standards that were created and decided that are directed to the demands of the sector. This calls for flexibility in the method of teaching or training. As opposed to being fixated on the instructor, who possesses the authority over what is taught as well as how the information must be studied, CBT program skills training and education are more committed to the student or the student himself, emphasizing the role that potential students can perform in the learning process. Although both teacher-centered and learner-centered techniques are employed in CBT, the learner-centered approaches are given a higher priority. The CBT program makes use of the following facilitation strategies such as direct instruction method, discussion method, small group method, problem-solving method, research method, workplace experience learning, and CBT assessment.

Direct Instruction Method

When instructors must clarify a new learning idea or present applicants or students with a new topic of study, they find that this strategy is quite helpful. Using direct instruction, you can explain facts or demonstrate how they connect to one another. Due to the method's heavy reliance on one-way communication, there exist several opportunities to ensure that students master what is being taught. Moreover, it is demanding to teach psychomotor skills using this approach.

Discussion Method

This will enable students to share thoughts and information. When others value their ideas and contributions, it will encourage them to study more and advance in their studies. Additionally, it will assist the teacher in figuring out whether the student comprehends the subject's syllabus or its content. The debate will likely veer off subject, and the student who controls the conversation may persuade the other group members to agree with and support the student's opinions.

Small Group Method

Students will learn in pairs using this small group strategy. Students can assist one another in learning more quickly in this manner than the teacher can with the entire class. However, the physical setup of the classroom and the individual evaluation procedure utilizing this technique are likely to have difficulties and problems.

Problem-Solving Method

Among the most common teaching techniques for CBT programs is this approach to problem-solving. Students will be challenged; when they successfully answer a new problem, they will feel satisfied and more confident, and inadvertently, they will acquire new experiences and knowledge. Additionally, it will support and facilitate the growth of students' critical thinking abilities and increase their capacity for flexibility in various learning environments. But since students occasionally study alone, it is possible that they will not be prepared to understand everything they are supposed to. As a result, this notion will take a while to grasp.

Research Method

Field experiments, case studies, and assignments in laboratories or workshops are frequently completed using this research methodology. This will motivate students to explore issues, strive to come up with their own solutions, and rigorously assess the data they gather. Nevertheless, this approach would take a lot of work from the students and needs thorough study project planning.

Workplace Experience Learning

Practical training, often known as industrial training or workplace learning, is one of the key elements of a CBT program. The goal of the student or candidate gaining work experience in a real workplace is to give them a chance to develop problem-solving skills, interpersonal, organizational, and planning, as well as self-awareness and technical competence through experience at work in a real work situation with the facilitator's assistance. This idea is often repeated twice, with each round lasting two months of training time. Students or candidates should seize the chance to put the theory they have acquired in lectures into practice using this industrial training idea, especially if they are higher education students or candidates. However, due to a lack of available training locations and the restricted number of participating industries in the area, some students or candidates do not get the chance to experience this. Nevertheless, the CBT program "Workplace Experience Learning" has been designed differently from the conventional transportation sector. Therefore, this is intended to offer all candidates or students who adhere to the CBT program the opportunity to partake in this industry training, which will give them hands-on experience with skills they have studied in college. Candidates or students will receive practical training under the supervision of an expert in the subject in addition to being placed in firms that match their job abilities. The key distinctions between the two categories of industrial attachment notions are shown in Table 4.

Table 4
Industrial attachment

Traditional Education Industrial Attachment	CBT Workplace Experience
Institutions provide introduction letters to students, instructing them to choose their own areas of attachment	Institutions choose suitable industries for workplace experience, negotiate with them, and sign MOUs with them
Without any training standards/unit specifications, students participate in attachments and learn whatever the industries offer	Students enter the industry with the standards and unit requirements they will be learning at
Since there are no identifiable and qualified facilitators, assessors, and verifiers, attachments are not properly directed and examined	Industry assessors and facilitators are chosen and trained to work with students
Students on attachment are only occasionally and generally monitored Effects: Some students can readily avoid the attachment	To make sure that they develop the necessary competencies, students are extensively monitored daily, weekly, as well as monthly using logbooks, facilitators, registers, assessors, as well as verifiers
The attachment may not be included in the certification and has no credit value	Workplace Experience contributes to certification and has a credit value

By referring to the distinctions shown and asserted in Table 4 above, one will be allowed to say with certainty that the concept of CBT programs, which emphasizes workplace experience, is a lot more effective method than the idea of traditional industry involvement for creating competent graduates. This is because the student or candidate of the CBT program can have a character that is more optimistic toward work and aware of what must be accomplished in practice. Moreover, the experience at the workplace via the concept of CBT is more systematic and organized.

Different parties in multiple industries whose students were involved in the CBT program provided testimonials and favorable comments. The candidate or student will have a learning experience at the workplace, and the candidate or student has demonstrated excellent and positive performance as a candidate or student of this CBT program. Because they can all assess, apply, and implement what they learned in lectures for use in the workplace, students' or candidates' capacity is impressive. They take great pride in their skill and efficiency, which are considerably above the value of the average performance scale.

The discipline and productivity of the students in this program have increased at work, as per opinions and assessments from different parties within the industry that are examined about students or candidates via the CBT program while working or undergoing practical industrial training at their respective places.

CBT Assessment

There will be an assessment procedure set up for each student or candidate to make sure and assess if they were able to retain the information taught during the program. The assessment procedure will be carried out in accordance with the goals stated in the learning unit descriptions made for each course. Thus, the process of acquiring evidence of student performance is where CBT evaluation takes place. Qualified assessors are selected to determine the degree to which students can complete the activities in each unit. The designated competent assessor will next determine whether the student or candidate has succeeded and attained the learning objectives in their entirety or not, depending on this evaluation. In other terms, the goal of this CBT method is to evaluate a student's or candidate's knowledge, skills, and understanding in relation to the established and determined employment requirements for a particular unit. For example, suppose a student or candidate can demonstrate that they are competent and possess a degree of competence in an area judged to satisfy the criteria and specifications specified in the standard. In that case, they will be classified as pass or skilled.

The idea behind CBT's assessment process is to evaluate students or candidates to see if they are qualified or otherwise. As a result, only one of two outcomes may come from the assessment process: either they are competent, meaning they can perform the tasks that are given and described in the standard, or they are incompetent, meaning they are unable to perform the tasks that are given and described in the standard.

The evaluation procedure is not intended to evaluate students or candidates at the proficiency level required to meet any qualifying percentage standard. The student or candidate will undergo a re-evaluation procedure if their capabilities do not reach the criteria and they are unable to enhance their knowledge and skills subsequently.

The following strategies and techniques will be employed during the evaluation process to make sure that pupils are provided greater attention: i) Observation: Observing prospective students or candidates while they perform tasks in the workplace; ii) Product: Examining anything created, produced, or completed by students; and iii) Asking: Posing questions to students, who can answer in writing or verbally.

Challenges

In the early phases of this program's implementation, training centers or skill training providers may encounter some difficulties with the CBT approach. These issues with this program's implementation are listed below.

Financing

CBT is a kind of approach in skills and education training that requires a significant amount of expenditure due to the emphasis on the use of work equipment, extensive laboratories, as well as other learning and teaching materials for the purpose of this skill training. All the elements will have a significant financial impact, particularly when the number of trainees fluctuates. It becomes difficult because of money allocation restrictions from institutions and TVET program training providers. There are also other problems related to equipment for skill purposes, which are outdated and scarce learning facilities. In addition, donor organizations may provide cutting-edge teaching tools for early-stage programs. Still, usually, the number is not sufficient for all candidates or students to use once. As a result, all institutions in Malaysia that provide TVET programs must upgrade their learning equipment and facilities, which obviously comes at a high expense.

Facilitation

Another problematic issue is the learning places' facilities. The concept of CBT is student-centered; hence, adequate sizes of classes are focused on ensuring the efficient use of CBT facilities. For CBT, a class should have 16 to 20 students. Presently, major skill training center institutions have an average class size of 100 students. With the size of the available classes, it means it will allow five various facilitators to manage20 students in each class.

Competence Instructor

There is little uncertainty that additional facilitators with the necessary expertise to conduct CBT will be required for efficient program delivery. Nevertheless, considering the present condition in skill training institutions in which there is an insufficient number of trained facilitators to operate the CBT program, the cost of teaching staff will rise one time and may even increase as much as three times the cost for facilitators originally for the CBT program. The institutions that conduct this CBT program will face severe financial consequences as a result. Second, there is a tendency to "teach as we have been taught," which causes CBT trainers to quickly revert to traditional teaching roles, with the exception that initial training and follow-up assistance are provided to periodically coach and train these facilitators. The reality that not all programs offered at skill training institutes have utilized CBT programs further complicates the situation. However, the same teaching team employs both CBT and conventional teaching techniques. The facilitator will face difficulty switching between roles. To switch roles, carry out duties, and fulfil tasks and obligations successfully, a facilitator will require a lot of devotion and great resolve.

Benefits of CBT

The use of CBT in TVET programs will improve its relevance and quality, according to a large body of research. According to Norton (1987), there are several advantages to participating in a CBT program. These advantages are as follows: i) Participants will be allowed to attain the level of competence as required in carrying out tasks, ii) When they properly master particular abilities, participants will be able to boost their confidence, iii) Participants will get a transcript or list of proficiency levels in the job they have attained, iv) Training time will be used more efficiently and effectively given the trainee is a facilitator in learning rather than an informant, v) In comparison to the style and technique of giving lectures, working with participants in small groups or one-on-one takes up more training time, as well as vi) greater training time is spent determining each participant's aptitude for doing job-related tasks.

A demand-driven training and education program, CBT produces skills that are in high demand in the labor market. As a result, graduates who complete the CBT program do not experience the unemployment issue as it is handled by other programs. They can become self-employed after finishing the CBT program and the industrial training since they have the skills to start their own firm or be hired by a sector that requires their expertise. There is no question that graduates of the CBT program will be capable of providing services in the workplace. Still, they will also be capable of producing outcomes, which is what the workforce is expected to accomplish and what has been shown by the program's alumni.

In an age where many new industries are emerging, and these will greatly require the savvy of a qualified workforce to operate their industries. For example, Malaysia's oil and gas sector is in dire need of graduates with technical abilities to run the company's operations due to a lack of domestically certified workers. As a result, they must rely on the knowledge of foreign workers. If the country's technical institutes continue to adhere to the outdated TVET model, how can the nation provide trained labor? It is clear from what the CBT program offers and from the successful results of other developed nations with highly skilled labor pools, like Japan and the United Kingdom (UK), that competent graduates need to be trained via a CBT program for them to enter a variety of fields in the industry.

Conclusion

The transformative potential of TVET programs, particularly through the CBT approach, is significant in bridging the gap between educational outcomes and market needs. The shift from a traditional, instructor-centered model to a dynamic, learner-centered paradigm marks a critical evolution in vocational education that aligns with the demands of a modern, knowledge-based economy. This alignment is crucial in emerging economies where the disparity between the skills taught and those required by industries can hinder economic growth and development. Through the implementation of CBT, TVET in Malaysia has taken proactive steps to ensure that its curriculum not only meets the immediate needs of the labor market but also equips students with the skills necessary for lifelong learning and adaptability in a rapidly changing technological landscape. The integration of real-world applications, continuous assessment, and a focus on practical skills under the CBT model exemplifies a robust strategy to enhance the employability of graduates. Additionally, the program's emphasis on entrepreneurship and the development of soft skills like problem-solving and critical thinking further prepares students to contribute effectively to their communities and the broader economy. Nevertheless, the challenges of resource allocation, adequate training

of instructors, and ensuring equitable access to quality training must be addressed to fully realize the benefits of TVET. Malaysia continues to refine and expand its TVET offerings, the focus must remain on creating a flexible, responsive education system that not only meets current industry standards but anticipates future trends. This proactive approach will be key in securing a sustainable economic future and in fostering a skilled workforce that is equipped to handle the challenges of tomorrow's job market.

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